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EXAMINER

NGUYEN, PHU K

ART UNIT	PAPER NUMBER
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2671

DATE MAILED: 12/28/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/988,708

Applicant(s)

JANG ET AL.

Examiner

Phu K. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 06 June 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 13-17 is/are allowed.
- 6) ☒ Claim(s) 1-12, 18, 19 and 21 is/are rejected.
- 7) ☒ Claim(s) 20 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

*Phu K. Nguyen*  
Examiner  
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## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 6.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

Claim 7 is objected to because of the following informalities: in line 1, "any one of claim 3" should be changed to -- any one of claim 3 and claim 4 --. Appropriate correction is required.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 1-12, 18, 19, and 21 are rejected under 35 U.S.C. 102(e) as being anticipated by BOURGES-SEVENIER (US Patent Application Publication 2002/0036639 A1).

As per claim 1, Bourges-Sevenier teaches the claimed "apparatus for compressing an animation path" (paragraph 81, lines 11-12), comprising:

an interpolator analysis unit (paragraph 35, non-linear interpolators) for extracting a number of break points (paragraph 37, control points) from an animation path

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(paragraph 502, the animation path 502) and outputting keys and key values corresponding to the break points (paragraph 38, sixteen control points corresponding to key-values);

a key coder for coding keys output from the interpolator analysis unit (paragraphs 33 and 85, the coding/decoding of the keys in the data fields);

a key value coder for coding key values output from the interpolator analysis unit (paragraphs 33 and 85, the coding/decoding of the keyValues in the data fields); and

an entropy encoder for entropy encoding the keys and key values which are coded in the key coder and key value coder, respectively (paragraph 84, the variable length coding – i.e., the entropy coding – of the encoder 908), and outputting encoded bit streams (paragraph 82, lines 2-3, 11-12).

Claim 2 adds into claim 1 “the interpolator analysis unit determines the number of break points so that the difference between an approximated animation path, which is obtained by the predetermined number of break points extracted among the break points of the original animation path, and the original animation path is minimized” which Bourges-Sevenier teaches in the use of cubic Bezier curves and their corresponding control points to approximate the animation curve 502 (paragraph 46, thirteen Bezier control points to approximate - or minimize the curve-fitting error - the animation path 502).

Claim 3 adds into claim 1 “the key coder codes the keys output from the interpolator analysis unit by Differential Pulse Code (Modulation (DPCM) quantization method” which Bourges-Sevenier teaches in quantization (i.e., Pulse Code Modulation) of the difference between two consecutive elements, including the keys, of the data fields – so called DPCM quantization (paragraph 84, lines 1-4).

Claim 4 adds into claim 1 “the key value coder codes the key values output from the interpolator analysis unit by Differential Pulse Code (Modulation (DPCM) quantization method” which Bourges-Sevenier teaches in quantization (i.e., Pulse Code Modulation) of the difference between two consecutive elements, including the key values, of the data fields – so called DPCM quantization (paragraph 84, lines 1-4)

Claim 5 adds into claim 1 “wherein taking both end points of the original animation path as starting points, the interpolator analysis unit finds break points representing an approximated path which has the smallest difference from the original animation path, among break points” (Bourges-Sevenier, paragraph 46, lines 4-11; the approximation of the curve segments forming the original curve by the cubic Bezier curves), and this process is repeated until an approximated animation path is close to the original path (Bourges-Sevenier, paragraph 46, lines 14-17; a large curve segment is again divided into the smaller segments and approximated by a set of cubic Bezier curves in a similar manner for a better curve fitting error – for a better illustration, see

the background for curve fitting technique in figure 1 in which the divide of the original curve is repeated until the error criteria is met).

Claim 6 adds into claim 5 "wherein break points are determined so that the area difference between the original animation path and an approximated animation path is the smallest" which Bourges-Sevenier teaches in the selection of the control points to approximate the original animation curve (paragraph 38, lines 6-8; actually, the background in figure 1 shows a better illustration of the dependency of curve approximation error on the control points).

Claim 7 adds into any one of claim 3 and claim 4. wherein the DPCM quantization is coding the difference between a current value and the immediate previous value, or is coding the difference between a current value and an approximated value which is obtained by adding the immediately previous value to the difference between the immediately previous value and the previous value thereof which Bourges-Sevenier teaches in the quantization (i.e., Pulse Code Modulation code) of the difference between a current value and the immediate previous value – so called Different PCM or DPCM (paragraph 84, lines 2-4).

Referring to claim 8, Bourges-Sevenier discloses a decoder for decoding the encoded data of claim 1 (paragraphs 30, and 32-33; Bourges-Sevenier teaches the decoding site which is a combination of decoding stages corresponding to the reversed-

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ordered encoding stages of claim 1, it is also noted that in claim 8, the claimed "linear interpolation" has been taught in Bourges-Sevenier's paragraph 38, lines 11-15; the decision of selection between the linear and non-linear interpolations has also been discussed in paragraph 35, lines 1-6.

Referring to claim 9, the remarks presented above with respect to claims 8 and 3 apply equally to this claim.

Referring to claim 10, the remarks presented above with respect to claims 8 and 4 apply equally to this claim.

Referring to claim 11, the remarks presented above with respect to claim 1 apply equally to this claim.

Referring to claim 12, the remarks presented above with respect to claim 8 apply equally to this claim.

Referring to claim 18, the remarks presented above with respect to claims 1 and 5 apply equally to this claim.

Referring to claim 21, the remarks presented above with respect to claims 4 and 7 apply equally to this claim.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over BOURGES-SEVENIER (US Patent Application Publication 2002/0036639 A1).

The claim 19 adds into claim 18 "the path difference is expressed by the sum of areas of trapezoids or twisted trapezoids which are formed by the original animation path and the approximated animation path" which Bourges-Sevenier does not teach. However, Bourges-Sevenier teaches the minimization of the error between the two paths in a non-linear case through the selection of the control or break point (paragraph 38, lines 6-8). It would have been obvious to a person of ordinary skill in the art, for a simple geometry calculation, that the difference between the areas under the linear straight lines should have either a trapezoid or a twisted trapezoid shape. The purpose of express the path difference by the sum of areas of trapezoids or twisted trapezoids is to reduce the calculation time through a simplified calculation of the path error in curve fitting. It is just a trade off between the number of control points and complexity of the segmented curves required to approximate the animation curve; the linear interpolation with straight line segments are simple in calculation but would need a large number of control points to approximate the animation curve.



Claim 20 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The allowable feature in claim 20 is "an orientation interpolator, the path difference is defined as a differential rotation angle in a differential rotation transformation, which is the difference between a rotation transformation of the original animation path and a rotation transformation of the approximated path."

Claims 13-17 are allowed.

The following is an examiner's statement of reasons for allowance:

A data format of a bit stream comprising  
an array-type key flag for indicating key values of which axes are selected among key values corresponding to an x, y, or z coordinate of each break point of the animation path.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phu K. Nguyen whose telephone number is (703)305 - 9796. The examiner can normally be reached on M-F 8:00-4:30.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Zimmerman can be reached on (703)305-9798. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Phu K. Nguyen  
December 22, 2004

*Phu K. Nguyen*  
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December 22, 2004